

PATENT SPECIFICATION

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COMPLETE SPECIFICATION

DRAWINGS ATTACHED

Self-anchoring Device for Lodging in a Workpiece Aperture to Retain a Screw-threaded Member therein

We, A. A. RICE, INC., a corporation organised and existing under the laws of the State of New York, United States of America, of 16 Secatog Avenue, Fort Washington, Long Island, State of New York, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a fastening device, and more particularly to a self-anchoring fastening device adapted to be lodged within the aperture of a workpiece of substantial porosity and thickness as, for example, plasterboard, concrete or the like, and adapted to receive, and securely retain a threaded member therein.

Generally, self-anchoring fastening devices are limited in their applications to a workpiece having an aperture of relatively slight depth. This is so particularly because it has been found advisable to allow the major portion of the body of a fastening device to pass through and clear the thickness of a workpiece so that means ordinarily provided for anchorage on the "blind" side of a workpiece can be expanded and thus achieve anchorage. Where a workpiece, however, is of a substantial thickness, anchorage of the fastening device has been found difficult, if not impossible. Attempts at elongating the structure to meet varying thicknesses have resulted in a sharp loss of retentive strength of the anchoring characteristics of the device.

The object of the present invention is to provide a self-anchoring fastening device adapted to be lodged in the aperture of a workpiece having a substantial porosity and/or thickness and which will receive, retain and secure therein a threaded member.

(Prior art)

Accordingly, the present invention provides a self-anchoring fastening device fabricated of a resilient plastics material and comprising: a substantially annular head portion having an axially extending bore therethrough; a substantially annular body portion having an axially extending bore therethrough, said bore being in alignment with the bore of said head portion and generally narrower than the bore through said head portion; a pair of outer rib members integrally formed with said head portion at one end thereof and with said body portion at the other end thereof, said outer and inner rib members being in overlying spaced juxtaposed relationship, and said inner rib members extending from said head portion at the leading end thereof to said body portion medially therealong; a protuberance on each of said inner rib members along the inner surface thereof; a shank end portion of the body clear between the inner ribs and being dimensioned in relation to and in co-operation with said protuberances to be seated upon and locked against said head portion, and a central cavity formed between said head portion and said body portion whereby said shank portion is seated upon the leading end of said head portion and said inner and outer ribs are outwardly flared upon the application of compression upon said fastening device.

The present invention will now be described in detail with reference to the accompanying drawing, wherein like characters designate like parts in the several Figures, and in which:

Figure 1 is a plan of an embodiment of fastening device of the present invention, and Figure 2 is a sectional view of the device

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of Figure 1 taken on line 2-2;

Figure 3 is a sectional view taken on line 3-3 of Figure 1;

Figure 4 is a view of the securing member of the present invention shown within the aperture of a workpiece and having a conventional screw therein before securing;

Figure 5 is a view of the device as shown in Figure 4 illustrating an intermediate stage of securing of the screw; and

Figure 6 is a view of the device as shown in Figure 4 showing complete engagement of the screw therein and the fixture or other appurtenance being secured thereby.

The fastening device shown employs a self-anchoring nut member 10, in conjunction with a screw 50 having a conventional threaded shank 51. Although a screw 50 is shown in conjunction with the nut member 10, any conventional bolt or screw-threaded member may be used.

The self-anchoring nut member 10, which can be fabricated of any suitable resilient plastics material, such as zytel nylon, comprises a head portion 11 having an axially extending non-threaded bore 12. A flange 13 at the trailing end of said head portion 11 may assume a rectangular configuration in plan, as shown for example in Figure 1, or may be hexagonal, or assume any other convenient configuration extending from head portion 11, at the sides thereof, and outwardly therefrom. At the flange, there are provided cutting fins 14 to facilitate embedding the self-anchoring nut 10 within a workpiece.

The body portion 15 is provided with an axially extending non-threaded bore 16 in alignment with bore 12, and generally narrower than bore 12.

A pair of outer rib members 20, 21 are integrally formed with head portion 11 at one end thereof, and with body portion 15 at the other end thereof. Said rib members 20, 21 are provided with a plurality of steps 22, 22', 22'', on the outer surface thereof, said steps having progressively smaller diameters as they extend downwardly toward the head portion 11.

A pair of inner rib members 25, 26 integrally formed with said head portion at the top thereof, and extending to, and integrally formed with, the body portion 15 medially therealong, forms a central cavity 27. A shank portion 28 is provided at the lower part of the body portion 15, which is adapted to be seated upon the head portion 11 at point 29. Along the inner surface of inner rib members 25, 26, there are provided protuberances 30, 31 disposed inwardly within cavity 27 forming a restricted passageway within the central region of the nut 10.

Upon seating of nut member 10 within

the aperture of workpiece 52, screw 50 is passed through a preformed aperture of a fixture 53 which is desired to be secured to the workpiece 52, and into the bore 12. As screw 50 emerges into the central orifice 27, outward pressure is exerted upon protuberances 30, 31 causing it in turn to force rib members 25, 26 outwardly, and simultaneously forcing body portion 15 to move downwardly. The outward flare of rib inner members 25, 26 further causes outer rib members 20, 21 to flare outwardly so that a lock is effected within workpiece 52. As screw 50 moves progressively through body portion 15, body portion 15 is further moved toward head portion 11, effecting a collapse of nut 10 within the workpiece, and the shank portion 28 is seated upon and thereby locked against head portion 11 at point 29, as illustrated in Figure 6. It will be seen that protuberances 30 and 31 also act to support and maintain ribs 25, 26 in an outwardly flared position, and ribs 20, 21 in a similar position so that any withdrawing pull or force from without the fixture 90 will not dislodge nut 10 from the workpiece 52.

Although a specific embodiment has been described it will be evident that modifications may be made. For example, bores 12 and 16 may be threaded where a non-tapered type of screw-threaded member or bolt is utilized. Additionally, shoulders 13 may be inwardly bevelled so that it may be counter-sunk within a workpiece if desired. It is also to be understood that the self-anchoring nut 10 may dispense with cutting fins 14 or alternatively may employ one or more fins as desired.

WHAT WE CLAIM IS:—

1. A self-anchoring fastening device fabricated of a resilient plastics material and comprising: a substantially annular head portion having an axially extending bore therethrough; a substantially annular body portion having an axially extending bore therethrough, said bore being in alignment with the bore of said head portion and generally narrower than the bore through said head portion; a pair of outer rib members integrally formed with said head portion at one end thereof and with said body portion at the other end thereof; a pair of inner rib members integrally formed with said head portion at one end thereof and with said body portion at the other end thereof, said outer and inner rib members being in overlying spaced juxtaposed relationship, and said inner rib members extending from said head portion at the leading end thereof to said body portion medially therealong; a protuberance on each of said inner rib members along the inner surface thereof; a shank end portion of the body clear between the inner ribs and being dimensioned in rela-

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- tion to and in co-operation with said protuberances to be seated upon and locked against said head portion; and a central cavity formed between said head portion and said body portion whereby said shank portion is seated upon the leading end of said head portion and said inner and outer ribs are outwardly flared upon the application of compression upon said fastening device.
- 10 2. A self-anchoring fastening device according to Claim 1, wherein a flange is provided at the trailing end of said head portion; at least one cutting fin extends from the body of said head portion at the side thereof to said flange at the trailing end of
- said head portion; and a plurality of steps is provided along the outer surface of said outer rib members in the region of said head portion, said steps being of successively smaller diameters as they extend toward said head portion.
3. A self-anchoring fastening device substantially as hereinbefore described with reference to and as illustrated in the accompanying drawing.
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FIG. 1

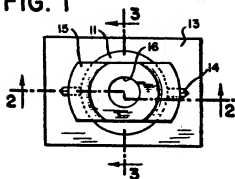


FIG. 2

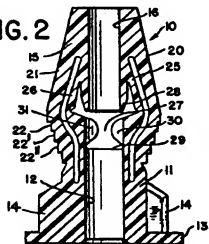


FIG. 3

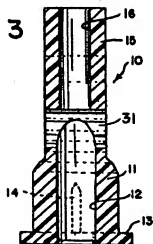


FIG. 4

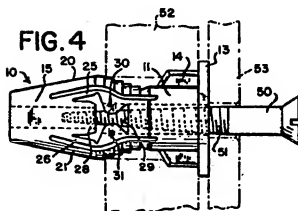


FIG. 5

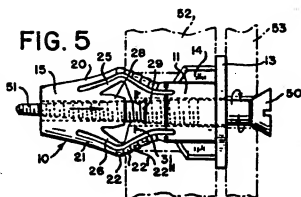
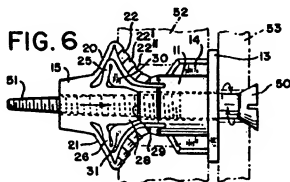


FIG. 6



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